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10/797,375	03/09/2004	Steen Orsted Andersen	81421-4038	4468

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EXAMINER
HENDERSON, ADAM

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/797,375	ANDERSEN, STEEN ORSTED
	Examiner	Art Unit	
	Adam L. Henderson	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 March 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,4,7,9,10,12,13,15 and 17-19</u> is/are rejected.

7)☒ Claim(s) <u>2,3,5,6,8,11,14 and 16</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.　　On page 3 of the current specification Applicant contends that Kikinis (WO 97/12483) does not "disclose a technical solution to create a high-resolution image from the scanned images." However on page 2 Applicant stated that Kikinis combines a number of images to create a high-resolution image, thus "a technical solution to create a high-resolution image from the scanned images" must be taught if the scanned images are combined to create a high-resolution image.

Claim Objections

2.　　Claim 7 is objected to because of the following informalities: On page 3 of the claims line 3, claim 7 states "aid sensor position", this should be --said sensor position--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3.　　The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.　　Claims 1, 4, 9, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kikinis (WO 97/12483).

5.   With regard to claim 1 Kikinis discloses a method for converting a low resolution first image produced by a light sensor (CCD array 13, FIG. 1) for receiving incident light radiated from a scene to a high resolution second image, whereby the light sensor is constructed as an array or matrix having a number of cells with each cell defining a predetermined area (FIG. 1, page 6 lines 11-21), which method comprises:

cyclically scanning the first image a number of times (page 6 lines 1-21);

simultaneously moving the light sensor with the scanning stepwise an identical number of times relative to the light radiating scene in at least one direction thereby defining a number of subareas, such that the total distance covered during movement of the light sensor corresponds to the extent of the cell or to the extent of the cell plus a distance defined by or to a neighbor cell in the at least one movement direction (page 7 line 26 – page 9 line 9), and

establishing a representation of the high-resolution second image by calculating the representation of the received incident light from the scene at each subarea (page 6 lines 19-21) [the subarea is the area covered by a single pixel of the image sensor whether it is 2 images or 5 (as disclosed in the above cited passages) or whatever is used to fully cover distance D1 on FIG. 2].

6.   With regard to claim 4 Kikinis discloses the method of claim 1, wherein the light sensor is moved asynchronously with the scannings (page 8 lines 1-8) [the imaging is disclosed as being before/after the movement, thus asynchronously].

7.   With regard to claim 9 Kikinis discloses the method of claim 1, wherein the light sensor is moved in a system of x-y coordinates and moved at least in one of the x-y directions of this system or in the direction of a cell of the light sensor (page 5 lines 21-30).

8.   With regard to claim 12 Kikinis discloses an apparatus for converting a low resolution first image to a high resolution second image, comprising:

a light sensor (CCD array 13, FIG. 1) for receiving incident light radiated from a scene to a high resolution second image, whereby the light sensor is constructed as an array or matrix having a number of cells, with each cell defining a predetermined area (FIG. 1, page 6 lines 11-21);

means for bringing the apparatus cyclically to scan the first image a number of times by means of the light sensor (page 6 lines 1-21);

means for moving the light sensor simultaneously with the scanning stepwise by an identical number of times relative to the light radiating scene in at least one direction, whereby the total distance covered during the movement of the light sensor corresponds to the extent of the cell or to the extent of the cell plus a distance defined by or to a neighbor cell in the at least one movement direction in order to define a number of subareas (page 7 line 26 – page 9 line 9), and

means for establishing a representation of a high resolution second image by calculating the representation of the received incident light from the scene at each subarea (page 6 lines 19-21) [the subarea is the area covered by a single pixel of the image sensor whether it is 2 images or 5 (as disclosed in the above cited passages) or whatever is used to fully cover distance D1 on FIG. 2].

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 7, 13, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Kikinis (WO 97/12483) in view of Knudsen (WO 01/42426).

11.   With regard to claim 7 Kikinis discloses the method of claim 1, which further comprises:

stepwise moving the light sensor by means of at least one driver relative to the light radiating

scene (page 7 line 26 – page 9 line 9).

    Kikinis fails to disclose recording the immediate position of the light sensor by at least

one position sensor generating output representing the aid sensor position, sending the output to

a computer having a software program for calculating control values on basis of the received

output, and sending signals representing the calculated control values to the at least one position

driver for bringing this to drive the light sensor in such a way that the steps of movement as

function of the scannings defines a predetermined curve.

    Knudsen discloses recording the immediate position of the light sensor by at least one

position sensor generating output representing the aid sensor position, sending the output to a

computer having a software program for calculating control values on basis of the received

output, and sending signals representing the calculated control values to the at least one position

driver for bringing this to drive the light sensor in such a way that the steps of movement as

function of the scannings defines a predetermined curve (FIG. 4 and 5, page 13 line 11 – page 14

line 10) [it is inherent that the system include a position sensor of some form, without a position

sensor it is impossible to know the location of the image sensor and thus impossible to know how the multiple taken images relate to each other in the X-Y space thus making the disclosed merging of the images impossible].

It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the method of Kikinis to include the curve taught by Knudsen in order to reduce Moiré effects (page 9 line 27 – page 11 line 14, Knudsen), thus resulting in a better image.

12.   Claim 13 is rejected under the same analysis as claims 1 and 7, further Kikinis discloses a frame for movably mounting the light sensor (frame 17, FIG. 1).

13.   With regard to claim 17 Kikinis discloses the apparatus of claim 13, wherein the computer is provided with a software program for establishing a representation of the high resolution image by calculating the representation of the received incident light from the scene at each subarea (page 6 lines 19-21) [combining the multiple images into a single high-resolution image is the same as calculating the light for each sub area, the subarea is the area covered by a single pixel of the image sensor whether it is 2 images or 5 (as disclosed in the above cited passages) or whatever is used to fully cover distance D1 on FIG. 2].

14.   With regard to claim 18 Knudsen discloses the apparatus of claim 13, wherein the at least one driver is an electromechanical device or a piezoelectric-element (piezoelectric element 15, FIG 7, page 13 lines 24-29).

15.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikinis (WO · 97/12483) in view of Yamada et al. (US 5,754,226).

16.   With regard to claim 10 Kikinis discloses the method of claim 1, but fails to disclose

which further comprises minimizing the influence of errors in previous calculated or estimated

values by means of a digital filter.

Yamada et al. disclose minimizing the influence of errors in previous calculated or

estimated values by means of a digital filter (column 13 lines 53-61)

It would have been obvious at the time of the invention to one of ordinary skill in the art

to modify the method of Kikinis to include the digital filter of Yamada et al. in order to reduce

the effects of flicker, shading, noise, and aliasing (column 13 lines 57-61), thus resulting in a

better resultant image.

17.   Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikinis (WO

97/12483) in view of Knudsen (WO 01/42426) as applied to claim 13 above, and further in view

of Yamada et al. (US 5,754,226).

18.   Claim 15 is rejected under the same analysis as claim 10.

19.   Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikinis (WO

97/12483) in view of Knudsen (WO 01/42426) as applied to claim 13 above, and further in view

of Lee (US Patent 5,214,513).

20.   Kikinis and Knudsen disclose the apparatus of claim 13, but fail to disclose wherein the

at least one driver comprises a coil rigidly mounted on a base frame and an anchoring means

mounted on the sensor frame, with the sensor frame being moveably mounted on the base frame,

and the anchoring means being actuated by an attractive force induced by the coil, thereby

pulling the anchor toward the coil.

Lee discloses wherein the at least one driver comprises a coil (coil 36, FIG. 1) rigidly

mounted on a base frame (foundation 10, FIG. 1) and an anchoring means (connection wires 20

and 22, FIG. 1) mounted on the sensor frame (aluminum frame 14, FIG. 1), with the sensor

frame being moveably mounted on the base frame, and the anchoring means being actuated by

an attractive force induced by the coil, thereby pulling the anchor toward the coil (column 3 lines

10-20).

It would have been obvious at the time of the invention to one of ordinary skill in the art

to modify the apparatus of Kikinis and Knudsen to include the coils/anchors of Lee in order to

provide a specific driver which can provide reliable movement of the image sensor.

Allowable Subject Matter

21.   Claims 2, 3, 5, 6, 8, 11, 14, and 16 are objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

22.   The following is a statement of reasons for the indication of allowable subject matter:

This is no disclosure in the prior art of the specific equation used to determine displacement used

in claims 2 and 3, there is no disclosure in the prior art of replacing pixels with position data as

per claim 5, there is no disclose in the prior art for the equation taught in claims 6, 8, and 14, and

there is no disclosure in the prior art of the equation taught in claims 11 and 16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam L. Henderson whose telephone number is 571-272-8619. The examiner can normally be reached on Monday-Friday, 7am to 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished . applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALH
14 May 2007

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER